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National Research Council Canada

Research and the problems of...

Ottawa

1922

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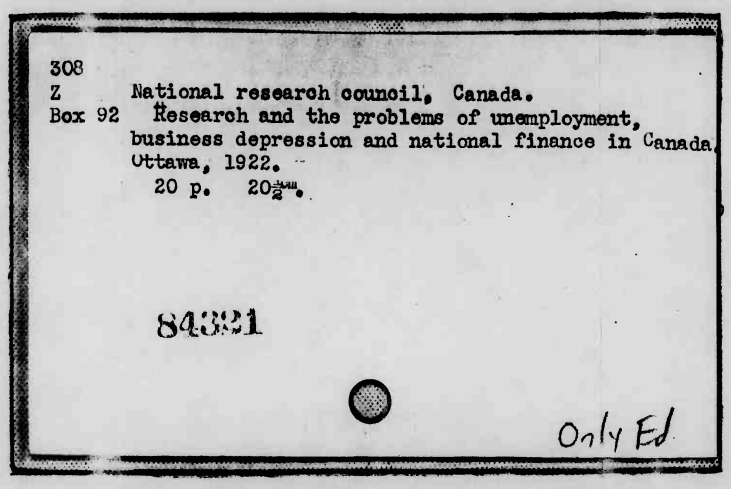

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RESEARCH

AND THE

PROBLEMS *of* UNEMPLOYMENT, BUSINESS DEPRESSION *and* NATIONAL FINANCE *in* CANADA

CANADA

Issued under the authority of the
HONORARY ADVISORY COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH
Ottawa, 1922

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A Canadian Creed

"I am not a Protectionist but I say this," declared a Statesman now dead. "The variety of work carried on among the citizens of Canada should be as comprehensive as possible.

Not because we are thus enabled to boast of the number of our trades —that would be mere vanity.

Not merely because our country should be able to fill as many as possible of its own needs without having to ask foreign aid.

Not merely because we should learn as soon as possible to finish the raw material with which Nature endowed us—rather than confess our helplessness by asking foreigners to finish them for us and giving them the wages and the profit on our raw materials.

Not merely because our country should as soon as possible escape from dependence for its prosperity on any one kind of production but should divide the risk among many.

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BUT BECAUSE CANADA should retain her most ambitious sons and daughters within her own boundaries by encouraging for their sakes that variety of occupation from engineering to farming —from chemistry to literature— which, if they want the highest rewards and honours, they are still compelled nowadays to seek abroad."

ONE of the serious drains on the strength of the Dominion of Canada is the annual loss of engineers, chemists, scientific farmers, and technical experts—whose training paid for by Canadians in Canadian schools and universities supported by Canadian public money, thus goes out to make foreign countries rich and place Canada further in their debt for foreign goods and services.

Monopolies of Knowledge

MONOPOLIES OF KNOWLEDGE—that is, monopolies of special branches of technical knowledge — constitute one of the most powerful weapons of trade to-day.

Secret agreements, combines, trusts, and the ordinary method of "conspiracies in the restraint of trade," become very mild and impotent weapons when compared to such formidable instruments as, for example, a secret chemical formula that might be scribbled on the back of a calling card.

In the bloodless wars for international trade it is the armies of chemists and engineers that must be mobilized, drilled, and directed against the parapets of unknown scientific facts. Export duties, credit leagues, intelligence departments, persuasive salesmanship, and even the magic of a great flag, cannot win or cannot hold, for long, trade for a country whose producers are not armed with scientific knowledge of their work.

A great camera manufacturing concern in the United States is able

to dominate its field in at least half the world because it knows more scientific secrets of that trade than anyone else.

Because, if a new concern started in opposition, it need only reach into its pigeon holes for some new formula—not otherwise convenient to exploit at present—by which to raise its product one step beyond the competition of the would-be rival.

So in steel-making!
So in the manufacture of electrical apparatus!
So in textiles!
So in chemistry!
So in agriculture!
So in every important branch of human industry!

So in Canada—as compared to other Nations—everyone of our industries is threatened, and must ultimately fall under the thrall of foreign domination unless it keeps pace with the advances in technical knowledge.

So, unless we master all that is to be known regarding the nature and possibilities of our vast supplies of varied raw materials, Canadians must ultimately find themselves at the mercy of foreigners who know how to prepare our riches for purposes of commerce.

What other Nations do!

FIFTY CONCERNS in the United States retain Research Departments at costs ranging from twenty-five thousand dollars to two million dollars a year.

In England, France and Germany, the race for technical knowledge for purposes of trade gathers speed.

The mere digger-out of raw materials gets the pay of a labourer.

The Nation that can finish its raw materials trebles and quadruples its rewards.

The question is—Shall Canada keep reasonably in pace with the modern movement? Shall Canada add to her natural possessions a superior knowledge of how to use them?

Can the needed variety of occupations for ambitious Canadian sons and daughters be maintained unless she does make places for such knowledge and encourages those who extend it?

Can the burdens of Canadian taxation and the evils of unemployment be off-set if Canada, in her struggle for markets and for good returns on her wares, does not possess herself of the instrument of technical knowledge?

The Government Task

NO GOVERNMENT should be expected to bear all the cost of discovering new scientific truths; that of course is paternalism. Most of the cost of this work must be left to private enterprise since it is by private enterprise that the new knowledge will be exploited, properties laid out, employees set to work, and production carried on.

But if every branch of Canadian enterprise starts independently in the pursuit of new scientific information, there is bound to be tremendous waste. Many duplicate laboratories would be required. Much over-lapping of effort would go on. In one laboratory time would be lost in proving or disproving what had already been learned in a laboratory somewhere else—and perfectly willing to share the knowledge.

A vast amount of energy and money would be wasted on ground work—instead of having the ground work done as far as possible in common and the money available for research concentrated

on the really new effort. To discover a quite simple formula might cost so much for laboratory and men as to discourage the enterprise.

A lack of organization would be, therefore, a drag on the wheel.

What has been suggested

IT HAS BEEN SUGGESTED in such circustances, that the universities should be mobilized. But this view has had to be abandoned, not merely because universities are scattered,—a difficulty which might be overcome to some extent by a subdivision of subjects, but because university routine cannot meet the requirements of the kind of research the business world now needs, without damaging the usefulness of the university to its students.

It has been suggested that the scientific staffs attached to certain Government Departments—as for example the wonderfully efficient Department of Mines at Ottawa, or the Food and Drugs Laboratory of the Department of Health—could satisfy this need. But the work, which is needed, cannot be done entirely by the Dominion Government. In many cases investigation can be carried out to the best advantage under one or more of the Provincial Governments, or under Federal and Provincial authorities in co-operation. Moreover it will often happen that the work cannot

be completed as a practical and commercial success without calling on the financial and other help of the industries which are concerned. In all such cases the work lies outside the duties of any Government department and should be directed by a body with greater independence and freedom from administrative duties.

Thus in England, in the United States, in Germany, and in Japan, the need for some central bureau of research to synthesize the efforts of its individuals has resulted in the establishment of State Institutions equipped and endowed by public funds, controlled by Parliament only in regard to the amount of funds made available for its yearly work.

The Present Proposal

IT IS PROPOSED that the Government of Canada should set aside $500,000 to erect and equip a building at Ottawa to be known as " The National Research Institute," and that it should make an annual grant for the carrying on of Research in the public interest.

In addition to this kind of work special confidential studies of commercial problems would be carried out for persons or corporations or trade guilds willing to pay the cost of such studies.

This organization would provide a Bureau of Standards—that is, a Bureau for the making of delicate tests, measurements or analyses of standard articles of Canadian trade —a work for which Canada has now to depend largely on the services of foreigners.

IN OTHER WORDS, instead of having to rely on the scattered and unorganized efforts of gallant and public-spirited investigators,— instead of having her manufacturers send their money, as happened

in at least one case, to a foreign state institute to buy research— Canada would have her own central Bureau of Standards for Research.

Here, laboratories and a library would be maintained for public use and a continuous study of Canadian materials would be carried on.

Here the results of ground work could be pooled and made available to anyone.

Here the engineer or chemist might find the last word in common knowledge of a subject and so have a much better taking-off place for his own research.

Here would be men who might be employed—at cost—to make experiments for this concern or that, their finding in such cases becoming the property of the man or firm or group of firms who paid the cost.

Here the finest instruments and apparatus would be available for those who desired to send their experts to explore some branch of knowledge.

Here in other words, the State would provide at cost, a common working place and a common repository of such new scientific knowledge as had been acquired at

public expense. At the same time, secret discoveries made at the expense of private enterprise, would remain the property of their discoverers—so long as used in the public interest—the public at large benefiting by the stimulus to industry and employment which, in theory at least, follows the application of such private knowledge.

THIS IS WHAT HAS BEEN DONE in foreign countries. This is what the Council of Scientific and Industrial Research believes should be done in Canada.

Questions to be answered

WHO KNOWS the secret of exterminating wheat rust?

No one. Yet by organized and perhaps long sustained research it can be discovered and meantime lack of this knowledge costs Canada and her farmers millions of dollars per year. Valuable work has been done on this subject under the Department of Agriculture and the Advisory Research Council, but much still remains to be done.

What should a black fox eat? How can this precious little fur-bearer be protected from the ravages of worms?—In the answer lie millions of dollars for Canada, and important steps towards the solution of the question have already been taken.

What use can we make of our tremendous supply of Helium?—It was greatly needed during the war as a gas for filling balloons. It will not burn—and at war-time prices Canada is wasting $50,000,000 worth every day of the week.

It is contained in our natural gas and escapes unused into the air.

Can we find another use for Helium besides the filling of balloons?—Here is enough money to wipe off our railway deficit. The Research Council has promoted the study of this question; the material is available; it is now a matter of finding uses, in times of peace, for this gas of which Canada can become one of the largest producers.

How can Canada be put into a position to meet its own heavy and increasing demands for fuel?

How can the great supplies of Lignite in the West and of Peat all over Canada be utilized for this purpose?

The study of these questions, begun by the Department of Mines at Ottawa and pushed on by the Advisory Research Council, has reached a point where success is in sight.

What practical way can be found of developing and using the enormous quantities of low grade iron ore that exist in Canada?

This too has received attention. Much has been done though much remains to be done and the answer cannot fail to be of immense importance to this country.

What can be done with our straw?

What can be done with our sawmill waste?

What should be done with our liquor from sulphite mills?

What about making artificial fertilizers by the use of our waterpowers?

These are some of the problems awaiting Canada's Bureau of Standards and Research; problems which have engaged the attention of the Advisory Research Council, with promising and even valuable results.

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Who is to do this work?

THE HONORARY ADVISORY COUNCIL for Scientific and Industrial Research consists of eleven of the leading scientists and experts of the Dominion.

Not one of them is paid, but, at the invitation of the Government, gives his scientific services to the public.

The Council has been in existence about four years, has developed its organization and has studied the whole field of Canadian resources and industries. It has found certain problems facing the Dominion which must be solved if the country's industrial development is to be furthered or even maintained. When it was convinced that a problem was one which might be solved, it selected a group of experts, or sometimes a single individual, and appointed them to carry out the work, arranging at the same time for the provision of the funds necessary for this purpose. In this way the various investigations were carried out by the men most competent to undertake them and under conditions most favourable for success.

IT IS THIS BODY of detached and disinterested men that sponsors the idea and requests the support of the Canadian public for a Bureau of Standards and Research at Ottawa.

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